

LA CIENEGA ACEQUIA, TRUCHAS MOLINO
334 Los Pinos Road
Santa Fe
Santa Fe County
New Mexico

HAER NM-14-A
NM-14-A

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

REDUCED COPIES OF MEASURED DRAWINGS

HISTORIC AMERICAN ENGINEERING RECORD
National Park Service
U.S. Department of the Interior
1849 C Street NW
Washington, DC 20240-0001

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LA CIENEGA ACEQUIA, TRUCHAS MOLINO

HAER No. NM-14-A

LOCATION: 334 Los Pinos Road, Santa Fe, Santa Fe County, New Mexico

UTM: Truchas Molino is located at latitude 35.5746, longitude -106.112. The coordinate represents the approximate location of the mill, along La Cienega Acequia on the property of El Rancho de las Golondrinas. This coordinate was obtained on 10 March 2009 by plotting its location on the Turquoise Hill, NM USGS Digital Raster Graphic in ESRI ArcGIS 9.2. The accuracy of the coordinates is +/- 12 meters. The coordinate datum is North American Datum 1927 CONUS.

DATES OF CONSTRUCTION: 1873-1940; moved 1968; restored 1991

BUILDER: Jose de la Luz Barela

PRESENT OWNER: George & Leonora Paloheimo, El Rancho de las Golondrinas

SIGNIFICANCE: The Truchas Molino is one of the only example of a Spanish Colonial-style grist mills powered by a *rodenzo*, a horizontal water wheel, that is currently operational in the United States. These *molinos* (grist mills) are unique because of their horizontal wheels, which turn in a counter-clockwise rotation, and operate without any gear mechanism. After serving the Village of Truchas from 1873-1940, the mill was saved and moved in 1968, and restored to working condition in 1991. It was relocated alongside La Cienega Acequia, a community shared irrigation ditch that has been active since ca. 1715. The Truchas Molino survives as a unique example of Spanish technological influence, and is a rare survivor of a once prevalent feature of eighteenth and nineteenth century rural northern New Mexico.

HISTORIAN: Christopher H. Marston, HAER Architect

PROJECT INFORMATION: Documentation of La Cienega Acequia, Truchas Molino was undertaken in 2007 for the Historic American Engineering Record (HAER), part of Heritage Documentation Programs, National Park Service, Richard O'Connor, Chief. The project was conducted in conjunction with the Santa Fe County Department of Planning, Jack Kolkmeier, Land Use Administrator; El Rancho de las Golondrinas, George Paloheimo,

Executive Director; and the 2007 Southwest Summer Institute for Preservation and Regionalism, Chris Wilson, Director, at the University of New Mexico School of Architecture and Planning, Roger Schluntz, Dean. Field recording and measured drawings were produced under the direction of Arnold Valdez, UNM Adjunct Associate Professor, and Eric DeLony, Chief of HAER, retired, and completed for transmittal by Christopher H. Marston, HAER Architect. The documentation was produced for the course, "Acequias: Their Culture and Future," led by Arnold Valdez. The team included UNM students Tita Berger, Ketan Bharatiya, Daniel Barboa, Miles Cook, Donatella Davanzo, J. Robert Estes, Jaime Estrada, Jeff Fredine, Lisa Gavioli, Eric Haskins, Steve Kramer, Ken Marold, Maria Morrissey, Holly Strachan, Peter Theroux, Gary Vincent, and Rowe Zwahlen. Large format photography was produced by Martin Stupich.

DESCRIPTION

The Truchas Molino is located beside La Cienega Acequia, a Spanish Colonial-style irrigation ditch along La Cienega Creek. The mill was moved in 1968 from the village of Truchas, New Mexico to El Rancho de las Golondrinas, a living history museum dedicated to celebrating the culture of Spanish Colonial New Mexico. Truchas Molino was restored in 1991 and is operated seasonally for public events.¹

The *molino* is housed in a simple crib structure of horizontal notched logs, measuring 12'-9" x 16'-10". The main milling floor sits 20" above a terrace, while the wheel pit sits 3'-9" below, on a dry laid stone foundation. The mill room is accessed by small door, only 5'-2" high, similar to Hispanic architecture of the Southwest. There is one small 9" x 14" window opening on the south wall.²

The water source for Truchas Molino is La Cienega Acequia, which varies from 2'-3" to 4'-0" in width, and 6" to 12" in depth.³ A *cano*a, a log flume with an 8" wide channel, diverts water from the acequia, several hundred feet upstream. Near the mill, the *cano*a slopes down a 30 degree angled chute into the wheel pit, producing a fall of about 4'. This relatively low fall is capable of powering the 43" diameter horizontal water wheel, which can run the millstone up to 69 rpm at a rate of approximately 1.0 hp. The *rodenzo* is made of wood with fourteen cupped blades, which give it 1.25 times the efficiency of a vertical wheel, and is water proofed with beeswax. The flow can be adjusted in the wheel pit by a *freno* (brake), which is a plank of wood laying horizontally over the wheel that can divert water from the *cano*a to the desired rate of flow. Once the water has passed through the wheel pit, it is diverted back into the acequia, to be reused for irrigation.

¹ Most of the information in this report comes from the following pamphlet: Earl Porter, "Molino Barela de Truchas and the Spanish Colonial Flour Mills of New Mexico" (El Rancho de las Golondrinas, Santa Fe, 2007), 1-4.

² Charles F. Gritzner, "Hispano Gristmills in New Mexico," *Annals of the Association of American Geographers* 64, no. 4 (December 1974): 516.

³ See related documentation on La Cienega Acequia, HAER No. NM-14.

The vertical shaft arrangement is supported by an iron bearing pin that rotates on an iron plate located beneath the wheel on the floor of the wheel pit. The wooden shaft stands approx. 7'-7" tall, rising up into the main milling floor. The shaft supports the *metate*, or grindstone, which is 26" in diameter. The grindstone runs independently from the *mano*, the upper running stone, and can be adjusted to control the fineness of flour or corn being ground. The two stones are housed within a wooden grinding stone cover. The *molinero* (miller) can adjust the speed of the mill with the *tarabilla* (damsel), an arrangement of sticks resting on the upper mill stone that automatically adjusts the flow of grain to match the grinding power of the water wheel. The millstones are also adjusted by a manual grinding wheel lever located at floor level, which is capable of lifting the wheels and stones to achieve the desired texture.

The wheat and corn is fed through a *tolva* (hopper) which is suspended above the wheel, and has a 22" square opening at the top, narrowing to a 6" opening. Grain then falls into a shoe, which controls the flow onto the millstones. A crude counterweight, comprised of a rock secured with horse hair, regulates the shoe. Once the grain has been fed through the millstones, it runs down a metal chute onto the *bolter*, a mechanical sifter screen. A vertical cam shaft, which runs off a belt drive from the main axle, powers the *bolter*. The shifter speed can be adjusted by replacing the crank arm of the cam shaft with different sized spindles. The finished grain or cornmeal is then filled into sacks for the local farmer and his family.

HISTORY

The Truchas Molino was originally built in 1873 by Jose de la Luz Barela near Truchas, New Mexico, about 50 miles north of the current site. The village of Truchas is in mountainous Rio Arriba County, along a tributary of the Santa Cruz River, which flows into the Rio Grande. The Barelas ground flour, *atole* (blue corn soup), *chaquegue* (porridge), and chile powder for family and neighbors until 1940. In 1968 Y.A. Paloheimo purchased the mill from the Barela family. He had it moved and reassembled at El Rancho de las Golondrinas, an outdoor living history museum that the Paloheimo family established in 1972. In 1990-91 the Truchas Molino was restored and made operational.

Spanish Colonial mills developed from Hispanic influences during the Spanish settlement era in the early seventeenth century, when this part of New Mexico was served by *El Camino Real de Tierra Adentro* (The Royal Road to the Interior). *Molinos* were most prevalent in the upper Rio Grande and Pecos River watersheds.⁴ These operations were an integral part of the *acequia* culture. The mill adapted well to the low flow of the *acequia*, which was adequate to power the horizontal wheel. The water was then returned to the ditch for irrigation. The *molino* served the local village, and a typical mill served thirty-five to fifty families each. It was not uncommon for two to three mills to be located near one another in larger settlements.⁵

⁴ Gritzner, 522.

⁵ Porter, 3.

The Spanish mills were of a simple design that could have been constructed from local materials by the *molinero* (miller) using everyday tools. The mill stones were shaped by hand by the *molinero* from vesicular basalt, the local lava rock found nearby at La Bajada. The housing was a simple crib structure, enough to protect the milling machinery from the elements. Generally, these structures were much less substantial than water-powered mills found on the east coast of the United States, which evolved from a European tradition. Unlike the eastern water wheels which turn clockwise, the entire mill arrangement of Spanish *molinos* runs counter clockwise. These mills are also unusual in that the milling machinery is controlled through carefully placed wooden rods rather than any gearing mechanisms.⁶

Truchas Molino is one of only about ten Spanish Colonial-style mills still standing in the southwest. Three of those mills are now at El Rancho de las Golondrinas. Just downstream from the Truchas Molino, the Golondrinas Molino sits on remnants of stone foundations from a former mill site on the property. This mill, originally in the Padilla family, was also moved from Truchas in the late 1960s. A third mill, the Talpa Molino, was also relocated to the museum grounds. Both the Golondrinas and Talpa *molinos* are of the horizontal wheel type, and await future restoration efforts. A fourth relocated mill on the property utilized a more traditional overshot vertical water wheel, the Molino Grande, which was originally built and used by the Pacheco family in Sapello, New Mexico. Its clockwise-rotating machinery was manufactured in Buffalo, New York, and is said to have been shipped to New Mexico by rail in the 1870s.⁷

Truchas Molino, like La Cienega Acequia that feeds it, is a rare surviving example of Spanish Colonial ingenuity and engineering that has survived for centuries in the mountainous Southwest. The successful operation of Truchas Molino and other *molinos* in the region helped sustain the local agricultural community, and became an important part of the cultural landscape. Its unique technology is a reminder of the important contributions of Spanish influences on the region and the nation as a whole.

⁶ Gritzner, 514.

⁷ Porter, 2; El Rancho de las Golondrinas website, available at: <http://www.golondrinas.org/index.html>, accessed 27 February 2009.

SOURCES

El Rancho de las Golondrinas website, accessed 27 February 2009, available at:
<http://www.golondrinas.org/index.html>

Estes, J. Robert, Jeff Fradine, Lisa Gavioli, Tita Berger. "La Cienega Acequia," HAER No. NM-14. U.S. Department of the Interior, Washington, D.C., 2009.

Gritzner, Charles F. "Hispano Gristmills in New Mexico," *Annals of the Association of American Geographers* 64, no. 4 (December 1974).

Porter, Earl. "Molino Barela de Truchas and the Spanish Colonial Flour Mills of New Mexico" [Pamphlet]. Santa Fe: El Rancho de las Golondrinas, 2007.